RAPPORT DE SESSION DE TRAVAIL
A MONTPELLIER
Visit of
Dr. Everina LUKONGE and M. Modeste ABOE
February 24th to March 20th

Projet CFC/ICAC/33

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Visit of Mrs Everina LUKONGE and Modeste ABOE

Dates: February 24th to March 15th (Everina) and 20th (Modeste).

Content

1 - **Objectives:**

- Visit CIRAD===➔ Done
- Explain project down to single activities ====➔ Done
- Explain conditions of employement of Everina and Modeste into D2.2. activity ➔ Done
- Explain official files for managing the project ➔ Done
- Look for contracts
    - LZARDI, TBS, CIRAD (comments to be seen on concerned countries) ➔ Done
    - AIC/SONAPRE, CERFITEX, CIRAD ➔ Done
    - ➔ still to be signed
- Explain files for reporting including relationships between partners to Project Executive Agency (PEA) ➔ Done

- Explain D.2.2. budget➔ Done
- Purchase computer for Modeste ➔ Done
- Purchase computer for Everina ➔ on process
- Meetings with Eric GOZE and Bruno BACHELIER
    - 25/02 ➔ Done
    - 04/03 ➔ Done
    - and 10/03 ➔ Done
- Goal: Build an experimental protocole for measuring the within-bale variability of cotton characteristics as measured by High Volume Testing (HVT) equipment.
- Output: an operating method for sampling (nb of samples per bale) and one operating method for measuring fibre characteristic (nbre of measurements per sample) for insuring measurment within internationaly agreed tolearances.
- Definition: SITC: standardized instrument for testing cotton is existing when all proper conditions are brought to perfrom cotton testing: air management system, proper training of technicians, proper calibration and proper calibration materials.
- Preparation of next visit : planning, content …

2 - <u>Additionnal:</u>

- Everina likes to learn more about fiber technology
    - 0623_04_BB_CSITC_Genesis_of_a_hair.pdf ➔ Done
    - 0623_03_JPG_AboutCotton_ValueAddedChain_V1.pdf ➔ Done
    - 0623_04_BB_Some_keys_to_produce_quality_seed-cotton.pdf ➔ Done
- Modeste wants to access to the bibliography ➔ list given, paper to be scanned on demand
- Everina goes back to Dar es Salaam on March 15th. ➔ Done
- Modeste will meet the Professors Dréan and Sinoiméri in Université de Haute Alsace with JPG on March 16th-18th, Modeste goes to paris on 18Th and back to Cotonou on 20th JPG goes back t MPL on March 20th. ➔ Done
- postdoc Everina : check in cotract, and see UHA ➔ Done
- Ask for English training seesion for Modeste ➔ Done
- Voir pour JMP pour les 2 ➔ Done, replaced by R + additionns + open office + Tinn R given on as memory sticks
- Voir pour formation en statistique pour les 2
- Voir pour formation sur logiciel choisi

3 - <u>Documents to be provided:</u>

- List of contacts in each regions to Everina and Modeste ➔ Done
- D:\Recherches\CSITC\CFC_ICAC_33\Activity_C.1.2.5_C.1.2.6_ExpertiseLaboratoriesRTCs\Mission_West_080427-080513_JPG\Seminaire/ CSITC Project v3_AD_Eng.ppt ➔ all presentation were given ➔ Done

- D:\Recherches\CSITC\CFC_ICAC_33\DocOfficiels/PROJECT DOCUMENT LT OV3.pdf ➔ Done
- Report from Mamadou a/s list of gins in West Africa to Modeste ➔ Done
- Report from Tanzania to Everina ➔ Done
- Calculation of perdiem and expenditures note to be given ➔ Done
- Tinn R to be given to Everina ➔ Done

4 - Schedule

Date	**Morning**	**Afternoon**
February 24th	Visit CIRAD	Explaining project and files
February 25th	Discussion with Eric Gozé and Bruno Bachelier	Discussion with Eric Gozé and Bruno Bachelier
February 26th	Suumary of the meeting conclusions from yesterday Continuation of explanation about the project	How to prepare the list of situations? Lists of situations in East and West by Everina and Modeste
February 27th	Check on the preparation of the situation list Purchase of modeste's computer	Check on the preparation of the situation list and continuation Preparation Bibliography file for Modeste
Private March. 1st	Visits	Visits
March 2nd	Preparation of list of situations	Description of the necessary steps for performing the experiments, hypothesis by hypothesis Continuation of the preparation of list of situations.
March 3rd	Preparation of list of situations	Preparation of list of situations Training on fibre technology with Everina Traning on computer for Modeste
March 4th	Meeting with Bruno Bachelier an Eric Goze	With Modeste list of situation Everina list of situation alone
March 5th	List of situations in East	Meeting with Eric Goze
March 6th	List of situations	List of situations
March 9th	List of situations, closing	List of situations, closing Estimation of the total number of samples in experiments
March 10th	Meeting with Eric Goze Preliminary data set from Tanzania study	Meeting with Eric Goze Preliminary data set from Tanzania study Preparation of randomization of samples at testing
March 11th	Everina : modification of situation and testing files	

Date	Morning	Afternoon
	Modeste : preparation of his trip in West Africa => demand to Cerfitex for advanced payment and flight tickets and Cerfitex car	
March 12th	Preparation of randomization of samples at testing	
March 13th	JPG for D.1 Preparation of randomization of samples at testing	Preparation of randomization of samples at testing
March 15th	Travel to Mulhouse by train	
March 16th	Meeting with Prof. Dréanet Artan SINOIMERI	
March 17th	Meeting with Prof. Dréanet Artan SINOIMERI	
March 18th	Meeting with Prof. Dréanet Artan SINOIMERI Modeste to Paris; JPG to Bruxelles	
March 19th	Meeting of the CoS Coton, Bruxelles	
March 20th	Modeste to Benin, JPG to Montpellier	

5 - Visit CIRAD

Visit of CIRAD campus in Lavalette, Scientific parc and Baillarguet.

6 - Explain project down to single activities

The project has been summarized thanks to Dar es Salaam awareness seminar documents.

Explanation of Project Document

7 - Explain conditions of employement of Everina and Modeste into D2.2. activity

JPG explained how Everina LUKONGE has been involved in the project during September 2008 mission in Tanzania. One contract has been signed between LZARDI, TBS and CIRAD.

JPG explained how Modeste ABOE has been involved to graduate a PhD during the duration of the project, within an agreement between CIRAD and with the Université de Haute Alsace. One contract has been signed between AIC/SONAPRA, CERFITEX and CIRAD.

8 - Explain official files for managing the project

We have seen the budget files (global, East and West for D.2.2.).

9 - Look for contracts

- LZARDI, TBS, CIRAD (comments to be seen on concerned countries)
- Focus on bolded countries in the following list
    - **Mozambique, Tanzania, Uganda, Zambia, Zimbabwe and possibly Sudan for Upland varieties**
    - Burundi, Egypt, Ethiopia, Kenya, Madagascar, Mauritius, Malawi, Rwanda and South Africa under conditions
- AIC/SONAPRA, CERFITEX, CIRAD
    - **BENIN, BURKINA FASO, CAMEROUN, COTE D'IVOIRE, MALI, SENEGAL, TOGO, TCHAD pour les variétés Upland**

- GHANA, GUINEE, GUINEE BISSAU, NIGER, NIGERIA, REPUBLIQUE DE CENTRAFRIQUE under conditions

10 - Explain files for reporting including relationships between partners to Project Executive Agency (PEA)

Explanation of project based on 0624_03_JPG_Explications_CFC_ICAC-33_v1.ppt (given to Everina and Modeste)

Explanation of perdiem declaration

- ask for actual perdiem rates
- ask for axchange rate between dollar and euro
- before using file Modele_Per diem Calculation.xls to declare / prove the requested perdiems.

11 - Explain D.2.2. budget

Done by reading the budget included in both contractual agreements.

12 - Purchase computer for Modeste

Done on Friday Feb; 27th.

JPG download Open office and R (statistical software) for installing on Modeste's computer when the Microsoft licence will be expired ➔ transferred to USB stick on March 1st

13 - Purchase computer for Everina

Under discussion by internet with Dominic Mwakangale.

JPG download Open office and R (statistical software) for installing on Evenina's computer when the Microsoft licence will be expired ➔ transferred to USB stick on March 1st and on one CD

14 - Build an experimental protocole for measuring the within-bale variability of cotton characteristics as measured by High Volume Testing (HVT) equipment

(SITC: standardized instrument for testing cotton is existing when all proper conditions are brought to perfrom cotton testing: air management system, proper training of technicians, proper calibration and proper calibration materials).

15 - Meeting with Eric GOZE and Bruno BACHELIER (25/02; 04/03 and 11/03)

Done, see file with operational details for each region.

Expected output: confidence in testing results from any laboratory in Africa; this requires the setting of operatings methods including sampling and testing procedures.

15.1 - List of sources / factors of within-bale variability

- **variety (seed quality)**,
- environmental impacts (rain, soil, insects, diseases, …),
- agricultural practices (sowing date, tillage, human work aspects),
- **harvesting**,

- on farm seed-cotton storage and transport,
- organization of the 1st trading on the market,
- seed-cotton transport to the gin and its storage,
- **ginning.**

➔ We have to select bales at random in "known' situations and/or collection of information from the above factors.

15.2 - Source of variability of measurement results

- within bale variability (listed above),
- sampling conditions,
- testing conditions.

15.3 - For making the sampling of bales, we first have to constitute stratas and choose bales in these strates.

Stratas:

1 – several varieties in border regions // one variety in region cores

Crossed by

2 – Heterogeneous growing conditions in small farmers production // homogeneous growing conditions witin a bale in big farmers production

15.4 - Work to do:

- Build a list of gins and/or companies and/or "situations" (combination of above factors of variability); ➔ under construction (see below)
- place them in the following table ➔ under construction (see below)
- please do not forget specific productions "situations" which cannot be divided up into the 4 combinations (A*B) example: worst specific case as Eastern part of Tanzania;
- describe all steps required to run the experiment ➔ under construction (see below).

	A1= several varieties in border regions	A2 = one variety in region cores
B1 - Heterogeneous growing conditions in small farmers production		
B2 - homogeneous growing conditions witin a bale in big farmers production		

Question BB: when a central lab is testing samples from various gins, will we have various operating methods for each gin or a common one? Answer: consider an operating method per gin, as a different cost may be demanded according to the real cost of testing; if the

differences of testing are small, then we can provide a common operating method for several gins or at the level of the country.

Question BB: if several (independent) labs exist in a country to classify the production, how to homogenize their results? Answer: this is the work of RTC (regional round-test, retest, trainings, expertises) and of the worldwide CSITC Round test.

15.5 - Summary of the experiment to be made

All the following hypothesis have to be proved in order to fill the objective of measuring the within-bale variability of cotton fibre characteristics and of designing operating methods in sampling and measuring those fibres:

15.5.1 - Hypothesis 1: The within bale variations are smooth enough to contemplate sampling by the lower (and upper?) sides only

➔ 10 bales taken at random * 8 layers per bale = 80 samples

➔ for every situation

15.5.2 - Hypothesis 2: the distribution remains unchanged (ideally Gaussian) during the whole ginning season and is not contaminated by abrupt changes

➔ 75 couples of two successives bales * 1 sample per bale every 2 days during the whole season = 150 samples

➔ for every situation

15.5.3 - Hypothesis 3: the between bales variations are smooth enough to contemplate a weighted moving average (the number of bales considered in this average can be increased up to the point that correlations decrease under a significative level) to improve the precision of the estimation of any given bale or to propose an estimate for the un-measured bales (risky)

➔ 100 consecutive bales * 1 sample per bale (later, it came to be 200 samples)

➔ for every situation

➔ 330 samples per situation in total in every situation

15.5.4 - Hypothesis 4: one sample on the current bale + one sample on the next bale is a good proxy to 2 samples per bale (top and bottom)

➔ 75 extra-samples on the sample for hypothesis 2 at the same time as hypothesis 2 or during an extra experiment in the most difficult situation (small scale, variable situation), meaning to be investigated only on the cotton produced by small holders = worst situation.

➔ some situations only

16 - Verification of measurement stability during the testing part of this experiment

16.1 - Calibration of HVTE

Calibration first day, and then calibration checks; if pass=> no problem, if fail => check everything and make a new calibation check if Pass ok unless make a calibration + records + include reference materials periodically

16.2 - Other checks of collected data

- Include reference material tested as samples on a periodical basis ➔ protection against unstable within-day conditions
- Include another reference material (which one?) in addition to Short/Weak and Long/Strong Upland HVICC tested as samples on a periodical basis ➔ Protect against off-limits conditions (day-to-day offset change compared to expectations)
- Register conditions of testing

16.3 - Number of consecutive measurements per sample

The idea is tio statrt with the USDA protocol:

- one IM,
- two measurements of Length/ uniformity index,
- two measurements of strength,
- two measurements of Color Rd and yellowness (possibly Trash measurement in addition),
- Insure that all data information for every measurement are collected in the database for statistical analysis.

16.4 - Randomization of the testing of samples

For every situation, the order of analyzing samples should be randomized ➔ protection against drifts of results along time (because of testing or lab conditions or human fatigue …)

16.5 - What is a result?

Result = true value + lab bias + sampling error + measurement error (supposed independent from sampling error) + random error;

➔ the final operating method will have to balance between sampling and measurements errors to help in defining the number of samples to be taken out of bales and the number of measurements to be made per sample on any cotton crop in Africa (extrapolation from the studied situations).

16.6 - Work still to be done

- find a third reference material in the middle of the range of Calibration Cottons➔ not necessary as it requires too much additionnal checks
- answer question: if any day-to-day changes in result on HVICC, do we adjust the data before analysis ? ➔ the answer is yes
- find the way to get any individual results from sample tested with 1IM + 2 LSCT/sample on HVI 1000/700
- how to choose samples to be sent to Cirad for retest purposes?

16.7 - Expected output

- a typical protocole to be applied by countries where we made the experiments
- a typical protocole to be applied by countries we did not consider at first for making the variability study.
- The typical protocole will be applied next year to

- Simplify the tested hypothesis
- Check the feasibility of its use on several crop years in various conditions
- To include the test of other hypothesis (more situations in year 2? …)

16.8 - Additional possible experiments foreseen from our discussions

- What is the impact of feeding the gin thanks to a telescope vs a module feeder onto the within and between bales variability?
- What is the best seed-cotton market organization allowing the lowest level of within-bale variability?
- What is the best seed-cotton market organization allowing the lowest level of between-bale variability?
- How precise is the evaluation of the quality of one un-tested bale when testing one bale out of several?

16.9 - Preparation of situations's list

We decided at first to prepare the list of situations according to the records of the following informations:

- RefSituation Code
- Country
- Variety
- AgroConditions
- Harvesting
- Gin name
- Gin type
- Gin alimentation
- Gin lint cleaning
- Gin equipment
- Gin remarks
- A1= several varieties in border regions
- A2 = one variety in region cores
- B1 - Heterogeneous growing conditions in small farmers production
- B2 - homogeneous growing conditions witin a bale in big farmers production

Then Everina and Modeste worked their own lists. From this work, we prepare 2 documents: for describing all the information and steps to perform the variability study for any given country in each region (VariabilityStudy_East_Vn.doc and VariabilityStudy_West_Vn.doc) where all details about the experiments can be found.

We created an Excel file to record bibliography made by Modeste for his PhD (bibliographie.xls) ➔ given to Modeste.

Modeste should know at least every thing about variance analysis (see if training course are existing on internet) for the PhD graduation.

Question to Eric according to the experiments:

- quality / price ratio: too many situations => high cost not foreseen => what is the good/proper "sampling of gin/situation" level?
- If one instrument gives different results on some days compared to the same machine or from another one, there will be some impact on the variance estimations: practical implications?

17 - Next steps

17.1 - Planning the next visits/meetings

JPG will go in East for the ICAC plenary meeting (Cape Town) and to Tanzania to meet Everina Lukonge in Ukiriguru/Mwanza from Sept. 12/13 to Sept. 19th.

Before coming back to France, all samples from the experiments have to be

- collected,
- sent to RTC for testing,
- tested in proper conditions by the RTCs.

Note 1: Samples have to be kept by the RTC until we finish running the staitstical analysis, in case we would demand for complement of testing on those samples.

Note 2: at every day of testing, Everina in East and Modeste in West should receive one new data file from the sample testings. Please make a copy to JPG. This will allow an every day and remote check of the testing operations through an observation of the collected data.

The required time between the last sample collection in the gin to the end of the analysis cannot last longer than 2 months.

Taking into account these delays and crop duration obligations, Modeste will be able to come to Montpellier not earlier than mid-September 2009, and Everina not earlier than mid-January 2010.

In the meantime, JPG was planned to go in West to meet Modeste Aboe in Parakou from Oct. 11-12 to Oct. 17-18th. But, in order to take care of the above information**, we will change this mission to 2nd week of December** in order to let Modeste come in Montpellier in September 24/28th-October 23th or so (dates to be decided according to the R training session dates). Plan to take the chance to register for the R training.

Everina Lukonge would then come in January 2010 (dates to be fixed latter).

17.2 - Exchange of files

Plenty files have been exchanged during the visit in Montpellier. Some of them are models to be fed with information to be then shared by email. When these models are fed, please send to JPG as a remote safe for these precious informations.

18 - Publications, communications, seminars…

In every paper, the Project and its funds have to be mentionned/cited.

19 - Visit in Mulhouse to Professeur Dréan

Most of details are included in file for West and East.

Important points :

- Modeste ABOE is registered as PhD student in Mulhouse
- Everina LUKONGE will be registered as Post-doctorate for her work in this project.